CoreBuilder® 5000 SwitchModule Quick Start and Reference

1.0 Introduction

The 3Com CoreBuilder® 5000 SwitchModule is a LAN switching module for the CoreBuilder 5000 Integrated System Hub. The SwitchModule is available in several media configurations and in single-slot and dual-slot models.

Before you unpack the SwitchModule, read Section 3.0, "Installation Prerequisites" and Section 5.0, "Installation Precautions".

WARNING: *CoreBuilder 5000 SwitchModules must be installed only by trained service personnel.*

2.0 Learning About SwitchModules

This document provides the basic information that you need to install and configure a 3Com CoreBuilder 5000 SwitchModule at software Version v3.0.

For more detailed information about using the SwitchModule, see the following documents:

- *CoreBuilder 5000 SwitchModule User Guide*
- *CoreBuilder 5000 Distributed Management Module User Guide* for software Version v6.00 or later
- *CoreBuilder 5000 Distributed Management Module Commands Guide* for software Version v6.00 or later

You can view these documents online with the 3Com *DocsOnCD* documentation CD-ROM that comes with this product.

To order hard-copy documents, contact your network supplier, or call 3Com Corporation at 1-800-724-2447 and choose the Customer Operations option.

3.0 Installation Prerequisites

Before you begin the SwitchModule installation process, read the hardware and software requirements in this section.

In addition to reading this document, be sure to read the Release Note for CoreBuilder 5000 SwitchModules.

3.1 Tools Required

You need a flat-blade screwdriver to install the CoreBuilder 5000 SwitchModule in the hub.

3.2 Hardware Prerequisites

1. Ensure that the CoreBuilder 5000 hub has at least one of the following management modules installed:
   - 6000M-MGT Distributed Management Module, Version v6.00 or later
   - 6000M-CMGT Advanced DMM/Controller Module, Version v6.00 or later
2. Ensure that the CoreBuilder 5000 hub has the following controller module installed: 6000M-RCTL Controller Module, Version v1.15 or later

Part Number 10013592

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3 Ensure that the CoreBuilder 5000 hub contains either a PacketChannel or a SwitchChannel backplane.

To verify that the hub has one of these backplanes, enter the command SHOW HUB. The model number displayed in the Hub Type field should end in C (SwitchChannel) or P (PacketChannel), and one of these backplanes should be listed under Backplane Type.

For example:

```
> show hub
Hub Information:
Hub Type: 6017C-AC
Backplane Information:
   Backplane Type                          Revision
   --------------                          --------
   Load-Sharing Power Distribution module   0
   Enhanced TriChannel Backplane            1
   RingChannel Backplane                    0
   SwitchChannel Backplane                  2
```

If your hub does not have an installed PacketChannel or SwitchChannel backplane and you require communication among SwitchModules, contact 3Com or your 3Com representative to order a backplane upgrade kit.

4 Use the following table to determine the slot restrictions that apply to your hub configuration:

Backplane Type	Hub Type	Installation Guideline
PacketChannel	17-Slot	Install SwitchModules in any slot.
	10-Slot	
	7-Slot	
SwitchChannel (PacketChannel plus ATM Cell-Switching)	17-Slot	Slots 9, 10, 11, and 12 are reserved for the CoreBuilder® 5000 ATM Switch/Control Point Module (Model Number 3C96416SW).
	10-Slot	Slots 9 and 10 are reserved for the CoreBuilder 5000 ATM Switch/Control Point Module (Model Number 3C96416SW).

If you are installing *only one* SwitchModule, you can install it in any slot, including a reserved ATM slot. The single SwitchModule acts as a stand-alone switch.

If your hub does not have an installed PacketChannel or SwitchChannel backplane, you can install only one SwitchModule per hub.

3.3 Software Prerequisites

Before you install a new SwitchModule:

1 Determine the DMM module's software version status. Enter the SHOW MODULE ALL command.

```
> show module all
```

The following display appears:

```
Slot   Module       Version   Network   General Info
-----  -------      -------   --------  -------------
10.01  6100D-MGT    v1.00     ETHERNET_1
11.01  6000M-RCTL   v1.15     N/A       Active
                                       Ctrl Module
12.01  6000M-ARCTL  v1.15     N/A       Stndby Ctrl
                                       Module
12.02  6000M-AMGT   v6.00     N/A       Master Mgmt
                                       Module
```

2 Look in the Version column to get the DMM software version. The new SwitchModule functions incorrectly if the DMM software version is wrong.

As shown in the previous display example, the Advanced DMM/Controller (Model Number 6000M-CMGT) appears as two modules in the same slot (Model Numbers 6000M-ARCTL and 6000M-AMGT). The DMM operational code version is displayed in the Version field of the -AMGT module.

4.0 Crucial Download Procedure

Review the following procedures before you attempt to download software to any SwitchModule in your hub.

You must use the following procedures if you have 66xx family SwitchModules installed in your hub.

4.1 Download Procedure for SwitchModules Earlier than Version v2.02 and DMMs Earlier than Version v5.00

Use the following procedure for all SwitchModules in your hub that are earlier than Version v2.02, and DMMs that are earlier than Version v5.00.

CAUTION: *All bridge port communication ceases if you use an incorrect download procedure to upgrade your SwitchModule and Distributed Management Module (DMM) and Advanced DMM (ADMM) software. If you use an IP relay for connectivity to download code to the DMM, that connection also stops.*

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For ease of reading and because the DMM and AIDMM are basically the same, the term DMM is used in this release note to refer to both modules.

CAUTION: *Do not upgrade to any later version until instructed to do so in Step 5.*

See the CoreBuilder 5000 Distributed Management Module User Guide, Chapter 11, for information about DMM downloading.

CAUTION: *Do not install the new SwitchModules yet.*

1 Upgrade all DMMs in the hub to software Version v5.00.

2 Download SwitchModule boot software Version v1.05 to all SwitchModules in your hub.

3 Download SwitchModule software Version v3.00 to all SwitchModules in your hub, even if they are already running Version v3.00.

4 Download ATM Backbone SwitchModule software Version v2.05 boot code, and then Version v3.00 operational code to all ATM Backbone SwitchModules in your hub. The Model Number is 3C96602M-MOD.

5 Upgrade all DMMs in your hub to software Version v6.00.

6 Install the new SwitchModule into your hub. (See Section 7.0, "Installing the SwitchModule".)

7 Download the Version v3.00 software code to the new SwitchModule.

To use the Frame Tagging feature, you must upgrade all SwitchModules in the hub to software Version v3.00 or later.

4.2 Download Procedure for SwitchModules at Version v2.02 or Later and DMMs at Version v5.00 or Later

If your hub contains any SwitchModules that are at Version v2.02 or later, and DMMs at Version 5.00 or later, complete the following download procedure:

CAUTION: *Do not install the new SwitchModules yet.*

1 Download SwitchModule boot software Version v1.05 to all SwitchModules in the hub.

2 Download SwitchModule software Version v3.00 operational code to all SwitchModules in the hub.

3 Download ATM SwitchModule software Version v3.00 operational code to all ATM Backbone SwitchModules in the hub. The ATM SwitchModule model number is 3C96602M-MOD.

4 Upgrade all DMMs in the hub to software Version v6.00.

5 Install the new SwitchModule into your hub. (See Section 7.0, "Installing the SwitchModule".)

6 Download the Version v3.00 software code to the new SwitchModule.

To use the Frame Tagging feature, you must upgrade all SwitchModules in the hub to software Version v3.00 or later.

5.0 Installation Precautions

Electrostatic discharge (ESD) can damage static-sensitive devices on circuit modules. Follow these precautions:

- Do not remove the SwitchModule from its antistatic bag until you are ready to inspect or to install it.
- Handle the SwitchModule by the front panel only; do not hold it by the component board.
- Use proper grounding techniques when you install the SwitchModule. These techniques include using a foot strap and a grounded mat, wearing a grounded static discharge wrist strap, or touching the metal rack or frame just before you handle the SwitchModule.

When you handle CoreBuilder 5000 SwitchModules, follow these precautions to avoid component damage:

- Do not twist or force the SwitchModule into the hub when you insert it into the module guides.
- Match the upper and lower module guides while you slide the SwitchModule into place.
- Do not push the SwitchModule all the way into the hub until the SwitchModule ejectors (if any) are open.

WARNING: *To ensure optical safety when you install 10BASE-FB/FL, FDDI, and 100BASE-FX SwitchModules, comply with the following precaution:*

Although the data communication LEDs and Lasers used in this product meet the regulatory requirements for casual exposure to the eye, as with any source of bright light, it is advised that you do not look into the light source.

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IEC 825, Class 1 LED Device. For connection only to Class 1 LED Devices.

6.0 Unpacking Procedure

Follow this procedure to unpack a SwitchModule:

1. Verify that the SwitchModule is the model that you ordered by examining the model number on the side of the shipping carton.
2. Remove the SwitchModule, in its antistatic bag, from the shipping carton.
3. Following the instructions in Section 5.0, "Installation Precautions", remove the SwitchModule from the antistatic bag and inspect it for damage.

   If the SwitchModule appears to be damaged, return it to the antistatic bag, repack it in the shipping carton, and contact your local supplier.

   Keep the shipping carton and antistatic bag in which your SwitchModule was shipped for future storage or shipment.
4. Record the serial number of your SwitchModule. Use the *CoreBuilder 5000 SwitchModule Planning Chart* that comes with this product.
5. Ensure that the CoreBuilder 5000 SwitchModule Kit contains these items:
   - CoreBuilder 5000 SwitchModule
   - *Release Note for CoreBuilder 5000 SwitchModules*
   - 3Com *DocsOnCD* documentation CD-ROM (contains *CoreBuilder 5000 SwitchModule User Guide*)
   - *CoreBuilder 5000 SwitchModule Quick Start and Reference* (this guide)
   - *CoreBuilder 5000 SwitchModule Command Reference*
   - *CoreBuilder 5000 SwitchModule Planning Chart*

7.0 Installing the SwitchModule

You do not need to turn off the CoreBuilder 5000 hub to install or remove the SwitchModule. You can install the SwitchModule while the hub is operating (which is called a *hot swap*).

Before you start the installation process, read Section 3.3, "Software Prerequisites," and Section 5.0, "Installation Precautions".

To install a SwitchModule:

1. Determine hub power. To ensure that the hub has enough power to support the new SwitchModule:
   a. Enter the SHOW POWER BUDGET command to see if sufficient wattage is available from the +5 volt, –5 volt, and +12 volt supplies.
   b. Using the values in the following table, add up the total power requirements for the SwitchModules that you plan to install:

	Power Requirement at		
Model Number	**+5 Volts**	**–5 Volts**	**+12 Volts**
3C96618M-TX-A	52 W	0.5 W	0.25 Watts for all modules
3c96620M-TP-A	25 W	0.5 W	
3C96612M-TP-A	23 W	0.5 W	
3C96624M-TP-A	30 W	0.5 W	
3C96624M-TPL-A	25 W	0.5 W	
3C96616M-BTP-A	35 W	1.0 W	
3C96610M-F-A	33 W	0.5 W	
3C96620M-F-A	50 W	0.5 W	
3C96614M-FTP-A	30 W	0.5 W	
3C96612M-FF-A	40 W	0.5 W	
3C96604M-F-A	31 W	0.5 W	
3C96612M-FC-A	57 W	0.5 W	
3C96604M-TX-A	34 W	0.5 W	
3C96604M-FX-A	35 W	0.5 W	

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c The total watts that are available in the hub (from step a) must be greater than the total watts that are required by the SwitchModules (from step b). Use the following worksheet to calculate power consumption:

Voltage Category	Watts Available in Hub	–	Watts Required by SwitchModule	=	Watts Remaining
+5		–		=	
–5		–		=	
+12		–		=	

2 To expose slots for SwitchModule installation, remove as many blank faceplates from the chassis as required.

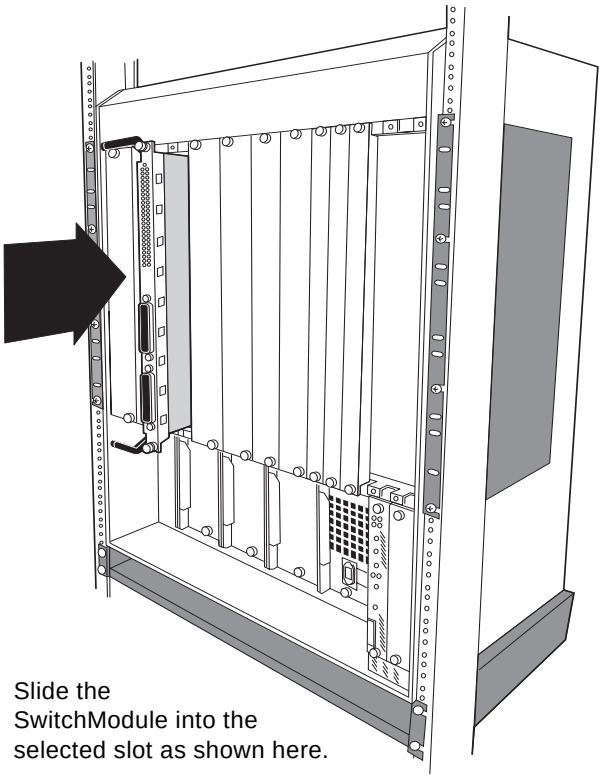
WARNING: *Hazardous energy levels exist inside of the hub. Do not place hands or objects into the hub or touch components on an inserted module.*

3 Insert each SwitchModule into the module guides at the top and bottom of the selected slot and slide it into the chassis by pressing firmly at the top and bottom of the front panel (see the figure at right).

4 Lock the SwitchModules into place by applying pressure to the front panel with one hand while you close each ejector handle. Ensure that the SwitchModule remains fully seated in the backplane connector while you close the ejector handles.

5 To secure the SwitchModule front panel to the front of the chassis, use a flat-blade screwdriver to tighten the top and bottom screws to torque specification 3 to 5 inch pounds. Do not overtighten.

WARNING: *For safety reasons and to ensure adequate cooling airflow, install blank faceplates over all empty slots.*



Slide the SwitchModule into the selected slot as shown here.

6 To ensure that the DMM recognizes the installed SwitchModule, enter the SHOW MODULE ALL command. Verify that the model number of the SwitchModule appears in the correct slot.

There may be a delay (no more than 30 seconds) before the DMM recognizes the SwitchModule.

7 Ensure that the hub is operating with enough power by entering the SHOW POWER BUDGET command.

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8.0 Basic Configuration Steps

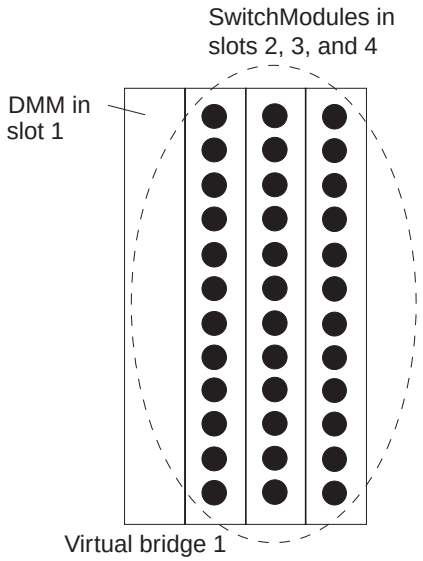
This section uses network configuration examples to introduce important concepts about implementing CoreBuilder 5000 SwitchModules in your network. Your network configuration may be more or less complex than the network configuration examples that are shown here.

8.1 Default Configuration After Installation

After you install one or more SwitchModule into the CoreBuilder 5000 hub, the default configuration is as follows:

- All SwitchModule ports are assigned to virtual bridge 1. This assignment means that all SwitchModule ports can communicate with all other SwitchModule ports, regardless of the slot in which they reside, and subject to the slot restrictions that are described in Section 3.2, step 4.
- All SwitchModule ports are automatically connected to the switching backplane in the hub (either PacketChannel or PacketChannel with Cell-Switching). You do not need to enter a command to assign ports to the backplane, as other CoreBuilder 5000 media modules may require.
- Ethernet Backplane SwitchModule backplane ports (ports 17 through 24) are permanently connected to shared Ethernet backplanes 1 through 8.
- All SwitchModule ports (except Ethernet Backplane SwitchModule backplane ports 17 through 24) are enabled and capable of switching traffic if you attach devices to the ports. You must enable Ethernet Backplane SwitchModule ports 17 through 24 using the DMM command SET BPORT_MAU MODE ENABLE or SET PORT MODE ENABLE. For information about the special port numbering system that applies to these ports, see Chapter 4 in the *CoreBuilder 5000 SwitchModule User Guide*.
- The Spanning Tree Protocol is enabled on virtual bridge 1 and on all SwitchModule ports. Spanning Tree parameters are set to their default settings, which are described in Chapter 7 in the *CoreBuilder 5000 SwitchModule User Guide*.
- Frame Tagging is disabled. For more information about frame tagging, see Chapter 8 in the *CoreBuilder 5000 SwitchModule User Guide*.
- The maximum vbridge value is set to 32, which means that you can assign ports to virtual bridges 1 through 32. To change this value, see Chapter 2 in the *CoreBuilder 5000 SwitchModule User Guide*.

The following figure shows the default configuration with three SwitchModules installed in the hub:



8.2 Enabling SNMP Management Through the SwitchModule

Configure IP settings for a virtual bridge only if the DMM has no other means of IP connectivity.

For example, you do not need to configure IP settings if the hub contains an Ethernet media module with a network monitor card (NMC) attached to it. The NMC provides connectivity between SwitchModules and the DMM.

If you do not already have an in-band connection to the DMM, and you want to manage the hub from a network management station (NMS) that is connected to a SwitchModule port, use the instructions in this section.

CAUTION: *Although the DMM supports multiple IP addresses, enable the interface for only one address per subnet (on the network that is attached to your default gateway). Enabling multiple IP interfaces on the same subnet may cause connectivity problems.*

When a model A SwitchModule (the model number ends in -A) is installed in the hub, include at least one of its ports in the virtual bridge that is acting as the IP relay interface. For example, if there are five virtual bridges, and if you are managing the hub through virtual bridge 1, ensure that virtual bridge 1 includes at least one of the model A SwitchModule's ports.

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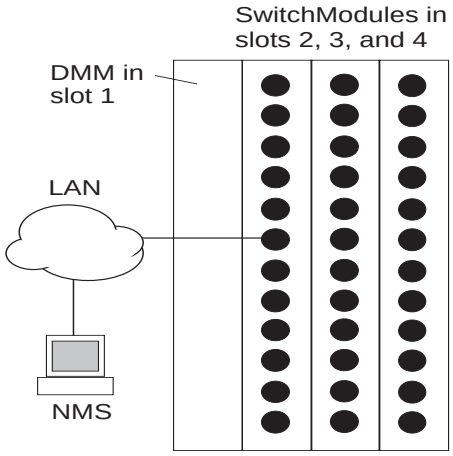
The following figure shows the hub configured with a network management station on the LAN that is attached to SwitchModule port 2.6:



To manage the hub from the network management station in the previous figure:

1 Configure IP settings for virtual bridge 1 using the commands in the following example (values shown are sample values):

```
> set ip subnet_mask ff.ff.ff.00 vbridge 1
> set ip ip_address 141.102.3.131 vbridge 1
> set ip default_gateway 141.102.3.2 vbridge 1
```

Assigning an IP address to a virtual bridge automatically enables the virtual bridge interface to the DMM.

2 Save the settings as follows:

```
> save ip
```

You can now access the DMM from the network management station. You can also send SNMP and RMON requests to the DMM. From the DMM, you can manage any network, virtual bridge, or module in the CoreBuilder 5000 hub.

If you have multiple subnetworks in your network, and you want to manage the hub in-band from each subnetwork, you must configure IP settings for each subnetwork.

If you already have an in-band connection to the DMM and if you still want to add in-band connectivity through a SwitchModule port, do one of the following:

- Before you establish an in-band DMM interface through the SwitchModule, assign the virtual bridge an IP address that is on a unique subnetwork.
- Disable the existing in-band DMM interface.

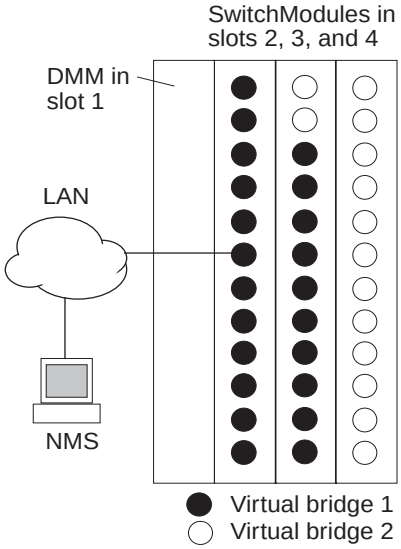
For more information about IP configuration, see the *CoreBuilder 5000 SwitchModule User Guide* on the *DocsOnCD* documentation CD-ROM that comes with this product.

8.3 Creating an Additional Virtual Bridge

A virtual bridge is a user-defined group of SwitchModule ports. This group of ports operates as a single logical bridge.

You can segment your network into more than one virtual bridge by creating new virtual bridges. You can assign any port on any SwitchModule to the new virtual bridge.

The following figure shows a SwitchModule network that is configured with two virtual bridges:



To create the configuration in this figure:

1 Enter the commands in the following example (values shown are sample values):

```
> set bridge_port 3.1 vbridge 2
> set bridge_port 3.2 vbridge 2
> set bridge_port 4.all vbridge 2
```

2 Save the settings as follows:

```
> save all
```

The new network configuration consists of two separate virtual bridges. Each virtual bridge maintains a separate Spanning Tree configuration. All ports on virtual bridge 2 are enabled by default.

The two virtual bridges that are described in this example cannot send traffic to one another at this point without an external connection. (See Section 8.4.) However, you can manage all ports on both virtual bridges using the DMM or other supported network management software, such as 3Com Transcend® Network Control Services.

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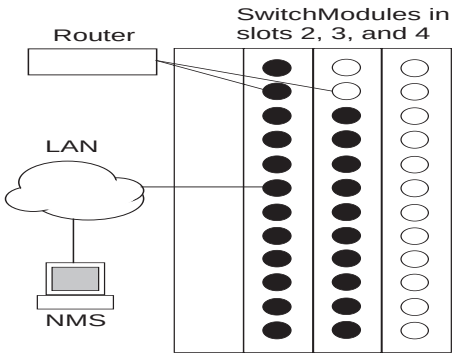
8.4 Enabling Communication Between Virtual Bridges

You can enable communication between virtual bridges by connecting ports on different virtual bridges through a front panel, through other physical connections (such as a router), crossover cables, or, if an Ethernet Backplane SwitchModule is installed in the hub, between virtual bridges over the CoreBuilder 5000 shared Ethernet backplane. For more information, see the *CoreBuilder 5000 SwitchModule User Guide*.

The following figure shows two virtual bridges that connect through a router:



Virtual bridge 1 and virtual bridge 2 can forward traffic to each other through the physical router connection between ports 2.2 and 3.2.

9.0 Finding More Information

This section describes locations of further configuration information in the *CoreBuilder 5000 SwitchModule User Guide*, which is located on the 3Com *DocsOnCD* documentation CD-ROM that comes with this product.

You can also use a network management application, such as 3Com Transcend Network Control Services, to further configure SwitchModules. See the appropriate network management documentation.

Management Task	User Guide Reference
Configure virtual bridges	Chapter 2
Configure SwitchModule memory resources	
Configure the address aging interval	
Hot-swap a SwitchModule	
Configure IP settings for SNMP management	Chapter 3
Enable and disable ports	Chapter 4
Configure media-specific port parameters, including PACE®	
Create filters according to packet destination address	Chapter 5
Configure source checking	
Create protocol filters and broadcast thresholds	
Change default translation settings for networks that run Raw 802.3 IPX protocol over a Novell platform	
Monitor network traffic using RMON and roving analysis port	Chapter 6
Monitor network traffic using DMM commands and supported statistics	
Manage SwitchModules using SNMP requests	
Manage the Spanning Tree configuration on your network	Chapter 7
Enable Frame Tagging	Chapter 8
Enable IGMP Snooping	Chapter 9
Troubleshoot SwitchModules	Chapter 10
Specifications	Appendix A
Designate the Network	Appendix B
Technical Support	Appendix C

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10.0 Common Front Panel Features

This section describes front panel features that all SwitchModules have in common, regardless of technology type and configuration. The figure to the right shows the common SwitchModule front panel features.

10.1 LEDs

SwitchModule front panels are equipped with LEDs that provide information about module status and traffic activity on the backplane.

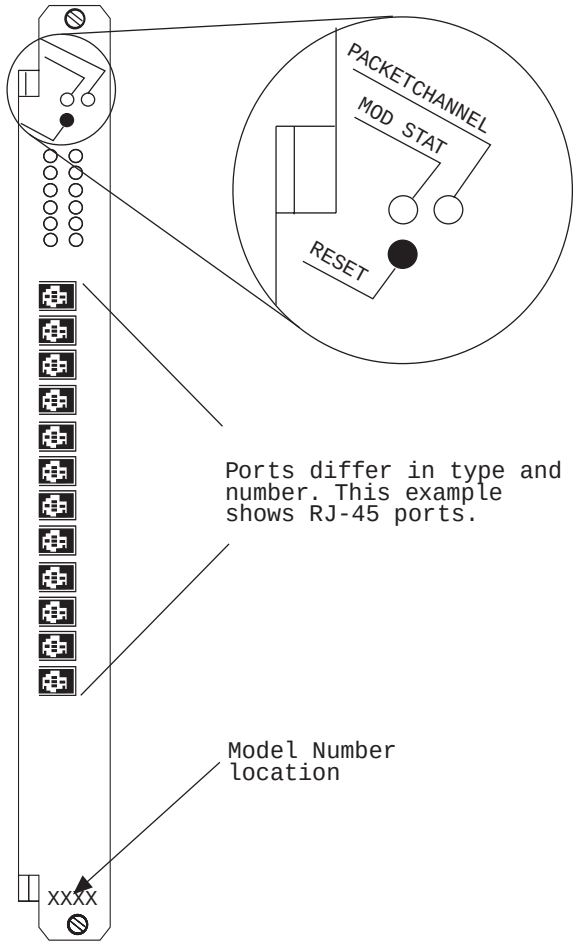
LED	State	Indicates
Module Status (MOD STAT)	Green On	SwitchModule powered on OK.
	Off	SwitchModule has failed.
	Yellow On	SwitchModule is running self-test diagnostics.
	Yellow Blinking	SwitchModule has failed self-diagnostics.
PacketChannel Status	Green On	SwitchModule is correctly inserted in chassis and connected to the PacketChannel backplane.
	Off	SwitchModule is not connected to the PacketChannel backplane or was inserted in slots 9 — 12 (17-slot hub) or 9 and 10 (10-slot hub), which are reserved for the ATM Switch/Control Point module.
	Yellow On	SwitchModule is transmitting heavy traffic levels to the PacketChannel backplane.
	Yellow Blinking	SwitchModule is transmitting normal traffic levels to the PacketChannel backplane.

10.2 Reset Button

Press the Reset button only if you suspect a problem with the SwitchModule. Resetting disrupts network traffic and affects the Spanning Tree topology. To press the Reset button, use a pen tip or other nonmetallic tool.

10.3 Ports

SwitchModule port types vary depending on media type and configuration. The following sections describe the port types, along with descriptions of the other front panel components of each SwitchModule.



11.0 10BASE-T SwitchModule Front Panel Features

This section describes the front panel features that are unique to these 10BASE-T SwitchModules:

- 12-Port 10BASE-T SwitchModule
- 20-Port 10BASE-T SwitchModule
- 24-Port 10BASE-T SwitchModule
- 24-Port Ethernet Telco SwitchModule

See Section 10.0, "Common Front Panel Features" for a description of the PacketChannel LED, Module Status LED, and Reset button.

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11.1 LEDs

The following table explains the 10BASE-T port status or activity LED blink sequences:

Port Status or Activity LED State		Indicates
Green	On	Port is enabled and link is OK.
	Blinking	Link failure or waiting for network connection.
	Off	Port or port functions are disabled.
Yellow	On	Heavy traffic activity on the port.
	Blinking	Normal traffic activity on the port.

11.2 Ports

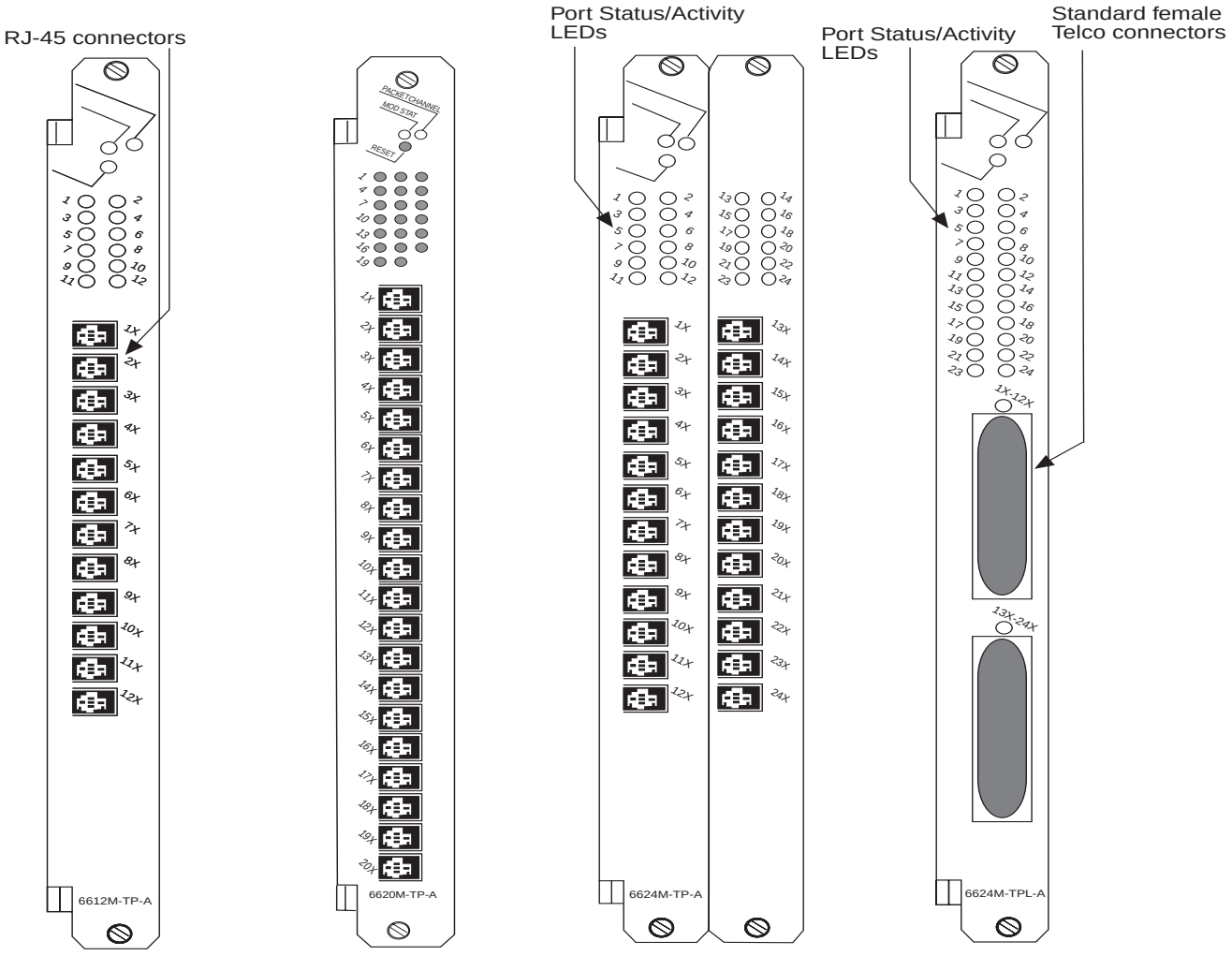
10BASE-T SwitchModules use the following port types:

- The 12-Port, 20-Port, and 24-Port 10BASE-T SwitchModules use crossover ports with RJ-45 connectors.

  CoreBuilder 5000 10BASE-T modules use crossover ports. This means that if you connect a 10BASE-T SwitchModule port to another CoreBuilder 5000 10BASE-T module port, you must use a crossover cable.

- The Ethernet Telco SwitchModule uses two standard female Telco connectors with 12 ports per connector for a total of 24 ports.

The following illustrations show these SwitchModules. The X that follows the port numbers indicates a crossover port.



12-Port 10BASE-T SwitchModule Model Number 3C96612M-TP-A

20-Port 10BASE-T SwitchModule Model Number 3C96620M-TP-A

24-Port 10BASE-T SwitchModule Model Number 3C96624M-TP-A

24-Port Ethernet Telco SwitchModule Model Number 3C96624M-TPL-A

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12.0 Ethernet Backplane SwitchModule Front Panel Features

This section describes the front panel features that are unique to the Ethernet Backplane SwitchModule. See Section 10.0, "Common Front Panel Features" for a description of the PacketChannel LED, Module Status LED, and Reset button.

12.1 LEDs

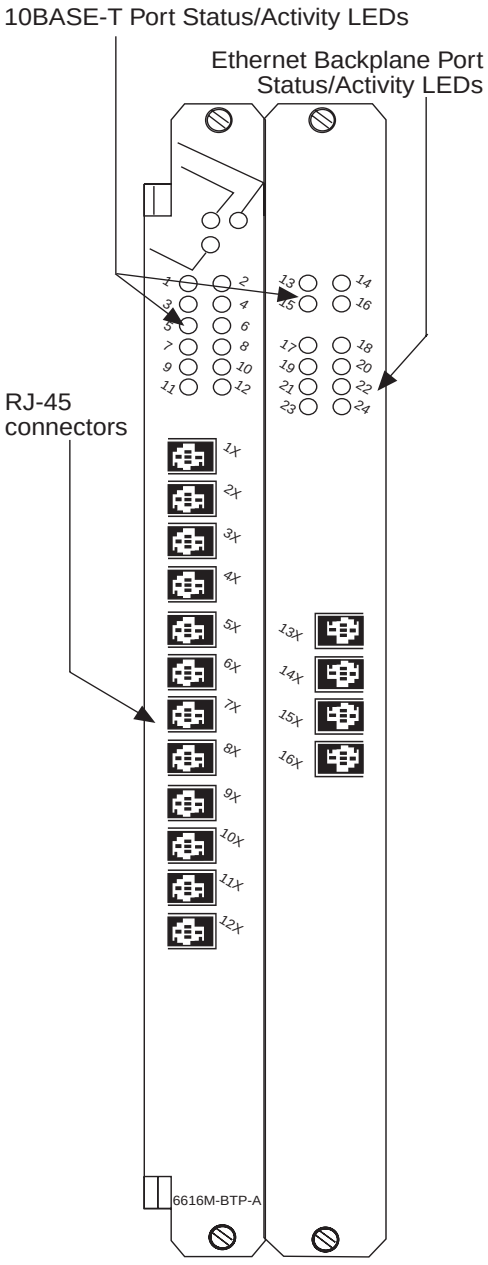
The following table explains the Ethernet Backplane SwitchModule port status or activity LED blink sequences:

Port Status or Activity LED State		Indicates
Green	On	Port is enabled and link is OK.
	Blinking	Link failure or waiting for network connection.
	Off	Port or port functions are disabled.
Yellow	On	Heavy traffic activity on the port.
	Blinking	Normal traffic activity on the port.

12.2 Ports

The Ethernet Backplane SwitchModule front panel ports use crossover ports with RJ-45 connectors (see the figure at right). The X that follows the port number indicates a crossover port.

CoreBuilder 5000 10BASE-T modules use crossover ports. This means that if you connect a 10BASE-T SwitchModule port to another CoreBuilder 5000 10BASE-T module port, you must use a crossover cable



16-Port Ethernet Backplane SwitchModule
Model Number 3C96616M-BTP-A

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13.0 10BASE-FB/FL SwitchModule Front Panel Features

This section describes the front panel features that are unique to the 10BASE-FB/FL SwitchModule. See Section 10.0, "Common Front Panel Features" for a description of the PacketChannel LED, Module Status LED, and Reset button.

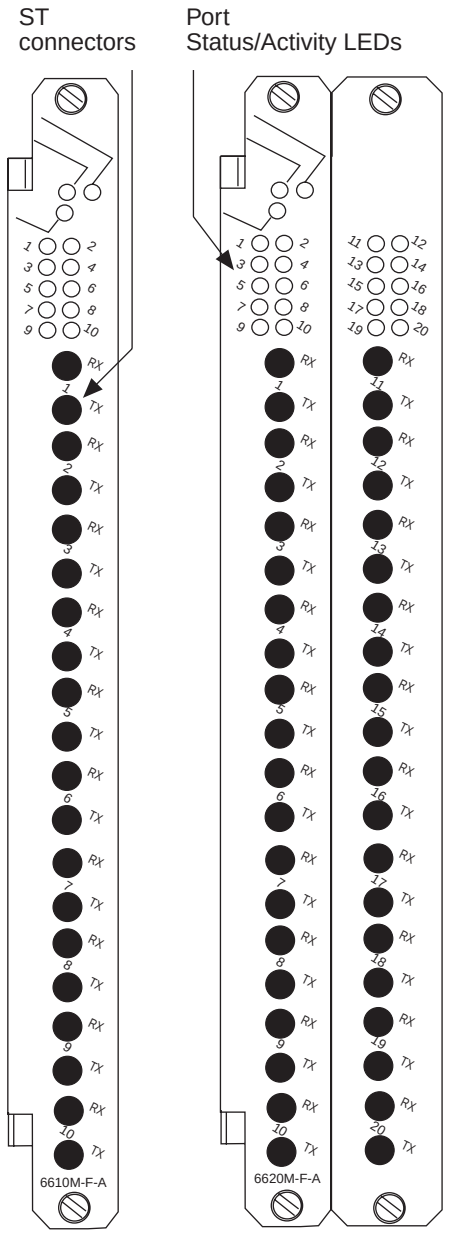
13.1 LEDs

The following table explains the 10BASE-FB/FL port status or activity LED blink sequences:

Port Status or Activity LED State		Indicates
Green	On	Port is enabled and link is OK.
	1 Blink	No light on receive fiber.
	2 Blinks	Port received jabber.
	3 Blinks	Port is partitioned.
	4 Blinks	Remote fault.
	Off	Port or port functions are disabled.
Yellow	On	Heavy traffic activity on the port.
	Blinking	Normal traffic activity on the port.

13.2 Ports

10BASE-FB/FL SwitchModules use ST connectors (see the figures at right).



10-Port 10BASE-FB/FL SwitchModule Model Number 3C96610M-F-A

20-Port 10BASE-FB/FL SwitchModule Model Number 3C96620M-F-A

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14.0 Mixed Technology SwitchModule Front Panel Features

This section describes the Fiber Distributed Date Interface (FDDI) ports and LEDs on the front panel of the following SwitchModules:

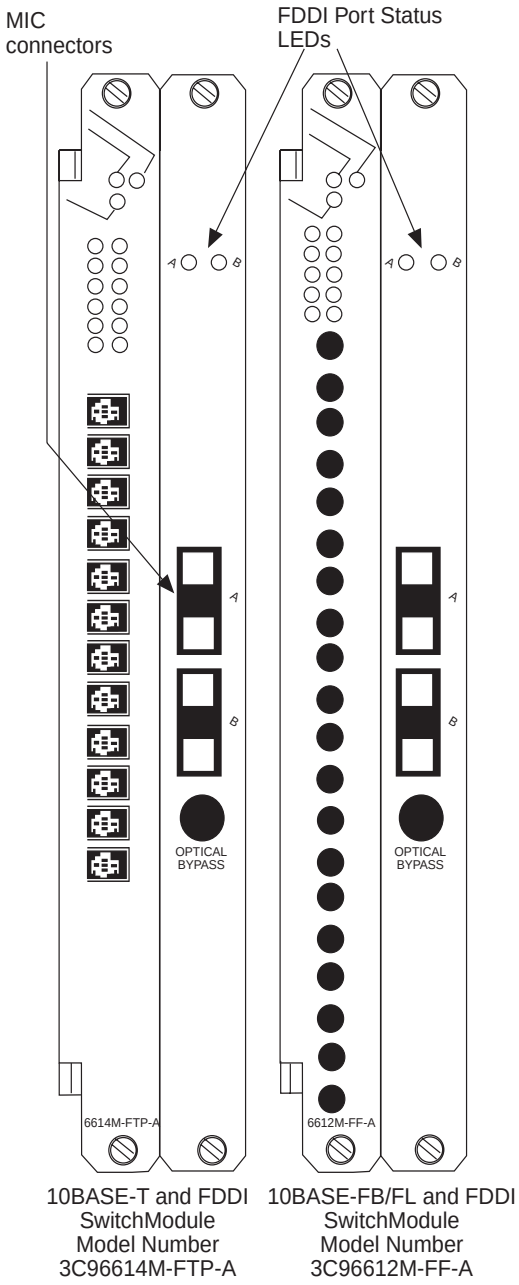
- 10BASE-T and FDDI Mixed Technology SwitchModule
- 10BASE-FB/FL and FDDI Mixed Technology SwitchModule

Section 11.0, "10BASE-T SwitchModule Front Panel Features", and Section 13.0, "10BASE-FB/FL SwitchModule Front Panel Features" describe the 10BASE-T and 10BASE-FB/FL ports, respectively. Section 10.0, "Common Front Panel Features" describes the PacketChannel and Module Status LEDs, and Reset button.

14.1 LEDs

FDDI LEDs are green only (not yellow). The following table explains the FDDI port status LED blink sequences and the 10BASE-T and 10BASE-FB/FL port status or activity LED blink sequences:

LED	State	Indicates
FDDI Port	Green On	Port is enabled and ring is operational.
	Green Blinking	Port is connecting.
	Off	Port or port functions are disabled.
10BASE-T Port	Green On	Port is enabled and link is OK.
	Green Blinking	Link failure or waiting for network connection.
	Off	Port or port functions are disabled.
	Yellow On	Heavy port traffic activity.
	Yellow Blinking	Normal port traffic activity.
10BASE-FB/FL Port	Green On	Port is enabled and link is OK.
	Green 1 Blink	No light on receive fiber.
	Green 2 Blinks	Port received jabber.
	Green 3 Blinks	Port is partitioned.
	Green 4 Blinks	Remote fault.
	Off	Port or port functions are disabled.
	Yellow On	Heavy port traffic activity.
	Yellow Blinking	Normal port traffic activity.



14.2 Ports

FDDI ports on mixed technology SwitchModules are Dual Attach Station (DAS) (A/B) ports that use MIC connectors.

14.3 Optical Bypass Connector

FDDI SwitchModules support one optical bypass connector per DAS port. Use the optical bypass connector to preserve a dual FDDI ring in the event of a station failure. The optical bypass connector accepts an optical bypass switch of type AMP FOTP-34 Method B using a mini-DIN connector.

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15.0 FDDI SwitchModules Front Panel Features

This section describes the FDDI ports and LEDs on the following SwitchModules:

- 2-Port FDDI SwitchModule
- 12-Port FDDI Concentrator SwitchModule

See Section 10.0 for a description of the PacketChannel LED, Module Status LED, and Reset button.

15.1 LEDs

FDDI LEDs are green only (not yellow). The following table explains the FDDI port status LED blink sequences:

Port Status LED State	Indicates
Green On	Port is enabled and ring is operational.
Green Blinking	Port is connecting.
Off	Port or port functions are disabled.

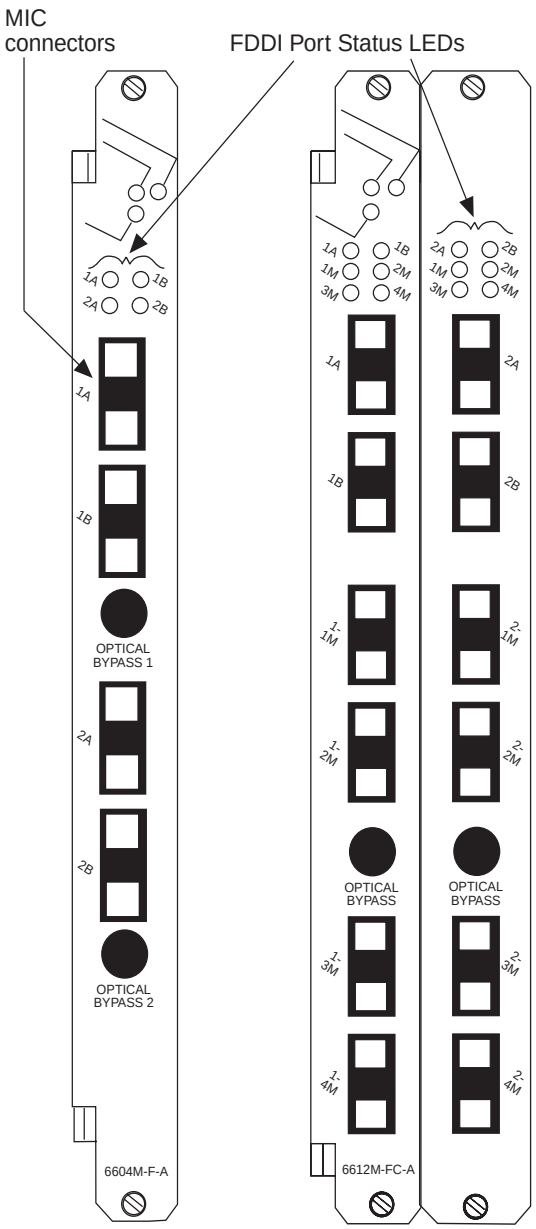
15.2 Ports

FDDI SwitchModules support the following port configurations:

- **2-Port FDDI SwitchModule** — Supports 2 DAS (A/B) ports with MIC connectors.
- **12-Port FDDI Concentrator SwitchModule** — Supports 2 DAS (A/B) ports and 8 Master (M) ports with MIC connectors. Each side of the FDDI Concentrator SwitchModule is a Dual Attachment Concentrator (DAC), which is composed of 4 M ports and an A and B port pair that is connected to a single MAC.

15.3 Optical Bypass Connector

FDDI SwitchModules support one optical bypass connector per port. Use the optical bypass connector to preserve a dual FDDI ring in the event of a station failure. The optical bypass connector accepts an optical bypass switch of type AMP FOTP-34 Method B using a mini-DIN connector.



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16.0 Fast Ethernet SwitchModule Front Panel Features

This section describes the front panel features that are unique to the Fast Ethernet SwitchModules. See Section 10.0 for a description of the PacketChannel LED, Module Status LED, and the Reset button.

16.1 LEDs

The following table explains the Fast Ethernet port status or activity LED blink sequences:

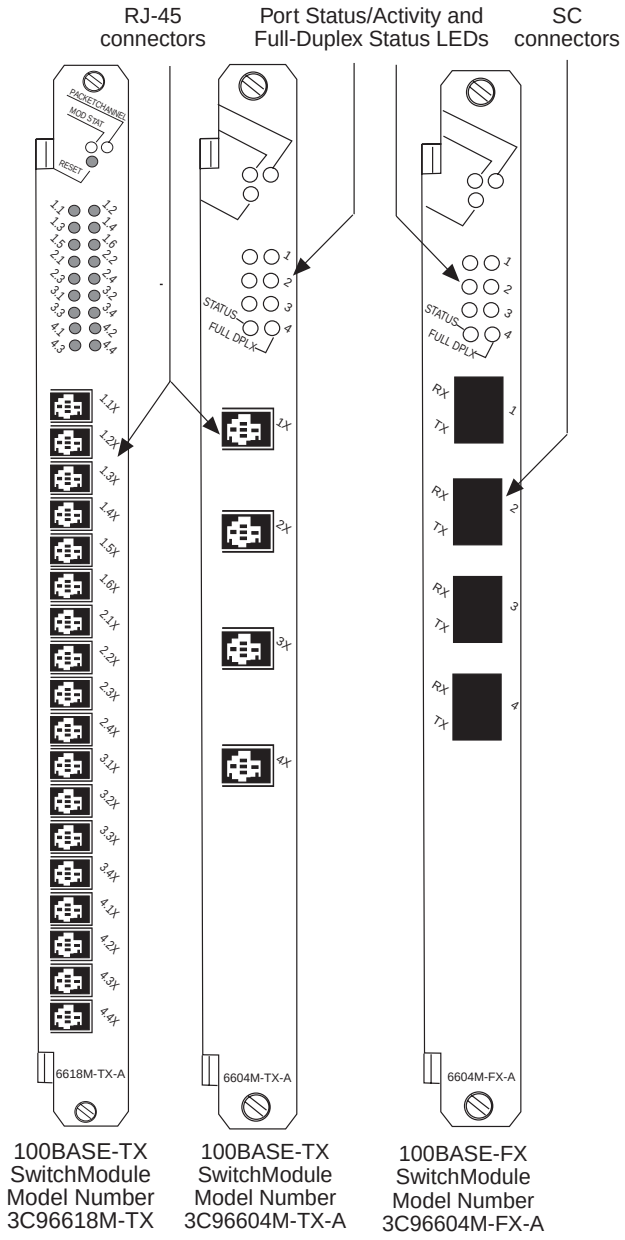
LED	State	Indicates
Port Status or Activity (One per Port)	Green On	Port is enabled and link is OK.
	Green 1 Blink	Link failure.
	Green 4 Blinks	Remote link failure.
	Off	Port or port functions are disabled.
	Yellow On	Heavy traffic activity on the port.
	Yellow Blinking	Normal traffic activity on the port.
Full-Duplex (Not found on the 6618M-TX)	Green On	Port is in full duplex mode.
	Green Blinking	Autonegotiation is determining the correct duplex setting.
	Off	Port is in half-duplex mode.

16.2 Ports

The 100BASE-TX SwitchModule uses crossover ports with RJ-45 connectors. The X that follows the port number on the SwitchModule indicates a crossover port.

CoreBuilder 5000 100BASE-T modules use crossover ports. This means that if you connect a 100BASE-T SwitchModule port to another CoreBuilder 5000 100BASE-T module port, you must use a crossover cable.

The 100BASE-FX SwitchModule uses SC connectors. See the following figures.



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